

WHAT IS CLAIMED IS:

1. A flow rate sensor comprising:  
a pair of heating resistors for heating a sensor tube;  
a temperature sensor for controlling respective  
temperatures of the heating resistors; and  
a case for holding the heating resistors and the  
temperature sensor,  
the flow rate sensor being adapted to detect a flow  
rate of a fluid flowing in the sensor tube, based on  
variations of voltages applied to the heating resistors,  
which variations occur according to the flow rate of the  
fluid,  
wherein (1) the sensor further comprises voltage  
applying means for arbitrarily setting an increase in  
temperature of each of the heating resistors, (2) the sensor  
tube has opposite ends thereof thermally connected to the  
case and (3) the temperature sensor is positioned to be  
equidistant from the opposite ends of the sensor tube.
2. A flow rate sensor according to claim 1, wherein the  
sensor tube has a U-shaped configuration.
3. A flow rate sensor according to claim 1, wherein the  
sensor tube is at least partially covered with a material  
having high heat conductivity.
4. A flow rate sensor according to claim 1, wherein a  
plurality of narrow inner tubes are provided within the  
sensor tube.
5. A flow rate sensor comprising:  
a pair of heating resistors for heating a sensor tube;

a temperature sensor for controlling respective temperatures of the heating resistors; and

a case for holding the heating resistors and the temperature sensor,

the flow rate sensor being adapted to detect a flow rate of a fluid flowing in the sensor tube, based on variations of voltages applied to the heating resistors, which variations occur according to the flow rate of the fluid,

wherein (1) the sensor further comprises voltage applying means for arbitrarily setting an increase in temperature of each of the heating resistors, (2) the sensor tube has opposite ends thereof thermally connected to the case, (3) the temperature sensor is positioned to be equidistant from the opposite ends of the sensor tube and (4) a sensor tube guide made of a material having high heat conductivity and adapted to cover the sensor tube is provided on the sensor tube, the sensor tube guide having the heating resistors provided thereon.

6. A flow rate sensor according to claim 5, wherein the sensor tube has a U-shaped configuration.

7. A flow rate sensor according to claim 5, wherein the sensor tube guide encloses the sensor tube and is removably provided in the case.

8. A flow rate sensor according to claim 5, wherein a plurality of narrow inner tubes are provided within the sensor tube.

9. A flow rate sensor according to claim 5, wherein the

heating resistors comprise metallic thin films.

10. A flow rate sensor comprising:

a pair of heating resistors for heating a sensor tube;  
a temperature sensor for controlling respective  
temperatures of the heating resistors; and

a case for holding the heating resistors and the  
temperature sensor,

the flow rate sensor being adapted to detect a flow  
rate of a fluid flowing in the sensor tube, based on  
variations of voltages applied to the heating resistors,  
which variations occur according to the flow rate of the  
fluid,

wherein (1) the sensor further comprises voltage  
applying means for arbitrarily setting an increase in  
temperature of each of the heating resistors, (2) the sensor  
tube has opposite ends thereof thermally connected to the  
case, (3) the temperature sensor is positioned to be  
equidistant from the opposite ends of the sensor tube, (4)  
the increase in temperature of each of the heating resistors  
is 5°C or less from a temperature of the temperature sensor  
and (5) a sensor tube guide made of a material having high  
heat conductivity and adapted to cover the sensor tube is  
provided on the sensor tube, the sensor tube guide having  
the heating resistors provided thereon.

11. A flow rate sensor according to claim 10, wherein the  
sensor tube has a U-shaped configuration.

12. A flow rate sensor according to claim 10, wherein a  
plurality of narrow inner tubes are provided within the

sensor tube.

13. A flow rate sensor according to claim 10, wherein the heating resistors comprise metallic thin films.

14. A flow rate sensor comprising:

a pair of heating resistors for heating a sensor tube;  
a temperature sensor for controlling respective temperatures of the heating resistors; and  
a case for holding the heating resistors and the temperature sensor,

the flow rate sensor being adapted to detect a flow rate of a fluid flowing in the sensor tube, based on variations of voltages applied to the heating resistors, which variations occur according to the flow rate of the fluid,

wherein (1) the sensor further comprises voltage applying means for arbitrarily setting an increase in temperature of each of the heating resistors, (2) the sensor tube has opposite ends thereof thermally connected to the case, (3) the temperature sensor is positioned to be equidistant from the opposite ends of the sensor tube, (4) the increase in temperature of each of the heating resistors is 5°C or less from a temperature of the temperature sensor, (5) a sensor tube guide made of a material having high heat conductivity and adapted to cover the sensor tube is provided on the sensor tube, the sensor tube guide having the heating resistors provided thereon and (6) a plurality of narrow inner tubes are provided within the sensor tube.

15. A flow rate sensor according to claim 14, wherein the sensor tube has a U-shaped configuration.